REMARKS/ARGUMENTS

Claims 1-2, 4, 12, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda et al (US 2003/0063234). Claims 9-11, 14 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda as applied to claims 1-2, 4, 12 and 23 above. Claims 5-8 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda as applied to claims above 1-2, 4, 9-12, 14 and 20-23 and further in view of Shibata (US 5,724,108).

1. Rejection of claims 1-2, 4, 12, and 23:

Claims 1-2, 4, 12, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda et al. for reasons of records, as cited in pages 2-3 in the above-identified Office action.

Response:

According to claim 1, the present application relates to a liquid crystal display device. The liquid crystal display device comprises a liquid crystal display panel; a light source for providing light beams to irradiate the liquid crystal display panel; and an optical sheet positioned between the liquid crystal display panel and the light source and **having a first surface facing the light source, the first surface having a plurality of prisms** for totally reflecting portions of ambient light beams that have passed through the liquid crystal display panel to irradiate the liquid crystal display panel and to increase a brightness of the liquid crystal display device by the portions of ambient light beams, each of the prisms comprising a first plane and a second plane, an included angle between the first plane and the second plane being in the range between 80° and 130°.

According to claim 12, the present application relates to a liquid crystal display

device. The liquid crystal display device comprises a liquid crystal display panel; and an optical sheet **having a first surface facing the liquid crystal display panel and a second surface opposed to the first surface, the second surface comprising a plurality of prisms** for totally reflecting portions of ambient light beams that have passed through the liquid crystal display panel to irradiate the liquid crystal display panel and to increase a brightness of the liquid crystal display device by the portions of ambient light beams, each of the prisms comprising a first plane and a second plane, an included angle between the first plane and the second plane being in the range between 80° and 130°.

It is an advantage that the liquid crystal display device of the claimed invention includes the optical sheet so that processes of forming a reflective layer in a panel or in a polarizer can be omitted, thereby decreasing production cost and increasing yield. Additionally, the ambient light beams for irradiating the liquid crystal display panel do not pass through a light-guiding plate and a reflective plate of a backlight module such that loss of the ambient light beams can be reduced, reflectivity of the ambient light beams can be increased and brightness of images displayed on the liquid crystal display device can be improved.

According to Fig. 1, Fig. 6 and col. 4, [0048], Oda discloses that "*Each prism projection of the array of parallel prism projections 15a has a substantially triangular cross section, and the interior apex angle γ (see FIG. 6) of each prism projection of the array of prism projections 15a is desirably in the range of* ***50° to 70°****, more desirably in the range of* ***60° to 70°****.*" According to col. 4, [0049], Oda teaches that "*The array of prism projections 15a is formed on the rear surface of the first light conversion member 15 in the illustrated embodiment; however, the array of prism projections 15a can be formed on* ***the front surface*** *of the first light conversion member 15.* ***In this case,*** *the array of parallel prism projections 15a serves as a light condensing device which condenses the light, which is emitted from the light guiding plate 11 and enters the first*

light conversion member 15, is refracted by the array of prism projections 15a to travel in a direction toward the front of the surface lighting device 10. When the array of prism projections 15a serves as a light condensing device, the interior apex angle of each prism projection is desirably in the range of approximately 80° to 100°, and more desirably in the range of approximately 85° to 95°."

In other words, the interior apex angle γ of each prism projection 15a **facing the light source** is in the range of **50° to 70°** in Oda's disclosure. If the interior apex angle γ of each prism projection 15a is in the range of 80° to 100°in Oda's disclosure, the prism projection 15a is formed toward the users (toward the liquid crystal display panel), not toward the light source. In contract, the interior apex angle of each prism facing the light source is in the range between 80° and 130° in the present application. As a result, Oda's liquid crystal display is different form the liquid crystal display device described in claim 1 and claim 12 of the present application.

Furthermore, as shown in col. 4, [0048], Oda discloses that "*If the interior angle γ is within this range, the light rays, emitted from the light exit surface 11b of the light guiding plate 11 and incident on the first light conversion member 15, is totally reflected thereby to travel in a desired direction efficiently*". As shown in col. 4, [0049], Oda teaches that "*In this case, the array of parallel prism projections 15a serves as a light condensing device which condenses the light, which is emitted from the light guiding plate 11 and enters the first light conversion member 15, is refracted by the array of prism projections 15a to travel in a direction toward the front of the surface lighting device 10.*" Accordingly, Oda's liquid crystal display includes a sheet for converging light from a back light source to a user. Thus, Oda's liquid crystal display does not totally reflecting portions of **ambient light beams** to increase a brightness of the liquid crystal display device by the portions of ambient light beams.

Referring to claim 1, Oda does not disclose the following limitations: (1) an optical sheet has a first surface **facing the light source**, and the first surface has a plurality of **prisms**, and (2) an optical sheet has a plurality of prisms for totally reflecting portions of **ambient light beams** that have passed through the liquid crystal display panel to irradiate the liquid crystal display panel and to increase a brightness of the liquid crystal display device by the portions of **ambient light beams**.

Referring to claim 12, Oda does not disclose the following limitations: (1) an optical sheet having a first surface facing the liquid crystal display panel and a second surface opposed to the first surface, **the second surface** comprising a plurality of prisms, and (2) an optical sheet has a plurality of prisms for totally reflecting portions of **ambient light beams** that have passed through the liquid crystal display panel to irradiate the liquid crystal display panel and to increase a brightness of the liquid crystal display device by the portions of **ambient light beams**.

Since Oda does not teach all the limitations in claims 1 and 12, claims 1 and 12 should be patentable in comparison with Oda's disclosure. Reconsideration of claims 1 and 12 is respectfully requested. Because claims 2, 4 and 23 are dependent upon claims 1 and 12 respectively, they should be allowable if claims 1 and 12 are allowable. Reconsideration of claims 2, 4 and 23 is respectfully requested.

2. Rejection of claims 9-11, 14 and 20-22:

Claims 9-11, 14 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda as applied to claims 1-2, 4, 12 and 23 above for reasons of records, as cited in pages 3-4 in the above-identified Office action.

Response:

Referring to claims 9-11, 14 and 20-22, Oda does not teach that (1) an optical sheet

has a plurality of prisms facing the light source, and that (2) an optical sheet has a plurality of prisms for totally reflecting portions of ambient light beams to increase a brightness of the liquid crystal display device by the portions of ambient light beams. For an optical device, the shapes, the angles, and the relative positions of the optical components can greatly affect the displayed image. Because Oda's sheet is not for reducing the reflection of ambient light beams, a person having ordinary skill in the art at the time the application was made has no reason to carry out the present application by Oda's disclosure.

Since claims 1 and 12 of the present application are not obvious to a person having ordinary skill in the art, the amended claims 1 and 12 should be patentable in comparison with Oda's disclosure. As claims 9-11 are dependent upon claim 1 and claims 14, 20-22 are dependent upon claim 12, they should be allowed if claim 1 and claim 12 are allowed. Reconsideration of claims 9-11, 14 and 20-22 is respectfully requested.

3. Rejections of claims 5-8 and 16-19:

Claims 5-8, 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda as applied to claims above 1-2, 4, 9-12, 14-15 and 20-23 and further in view of Shibata for reasons of records, as cited in page 4 in the above-identified Office action.

Response:

The structure of the present application is set for increasing the brightness of the liquid crystal display device by the portions of ambient light beams and provide a needed brightness for the liquid crystal display panel, while the above-mentioned cited references never teach to increase a brightness of the liquid crystal display device by portions of ambient light beams.

The Examiner points that Shibata discloses a liquid crystal display device

comprising an optical (prismatic) sheet employing the Snell law of refraction. However, the liquid crystal display device of Shibata's disclosure is set for widening viewing angle, and the present application is set for **increasing the brightness of the liquid crystal display device by the portions of ambient light beams**. Please refer to Fig. 2 of the present application. Because the light beams L_2 should be totally reflected by the first plane 38a, the included angle c must be greater than or equal to a critical angle of the optical sheet 36. That is to say $c \geqq \sin^{-1}(n_1/n_2)$. Since Shibata never teaches to increase a brightness of the liquid crystal display device by the portions of ambient light beams, Shibata does not disclose $c = \sin^{-1}(n_1/n_2)$. In other words, the structure of Shibata's optical sheet cannot fit in with the limitations in claims 5-8 and 16-19 of the present application. Claims 5-8 and 16-19 should be allowed in comparison with Shibata's disclosure.

On other hand, according to Figure 1(a), 1(b), 6, 13, Shibata discloses a liquid crystal display device comprising an optical sheet having a plurality of prisms facing the liquid crystal display panel. The optical sheet is used for converging the emitted light to increase the brightness of the backlight with the same power consumption as used in the conventional apparatus and to reduce power consumption of the backlight. Shibata does not teach **that (1) an optical sheet has a plurality of prisms facing the light source, and that (2) an optical sheet has a plurality of prisms for totally reflecting portions of ambient light beams to increase a brightness of the liquid crystal display device by the portions of ambient light beams.**

Because Oda's sheet and Shibata's sheet are not for increasing the reflection of ambient light beams, a person having ordinary skill in the art at the time the application was made has no reason to carry out the present application by Oda's disclosure and Shibata's disclosure. **Thus, the combination of Oda's structure and Shibata's Snell law of refraction cannot bring an optical sheet of the present application**. Therefore, the amended claims 1 and 12 should be allowable in comparison with the cited references.

As claims 5-8 and 16-19 are dependent upon claims 1 and 12 respectively, they should be allowed if claims 1 and 12 are allowed. Reconsideration of claims 5-8 and 16-19 is respectfully requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely yours,

Winston Hsu Date: 01/30/2007

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Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)